

COMMONWEALTH OF VIRGINIA
Department of Environmental Quality
Tidewater Regional Office

STATEMENT OF LEGAL AND FACTUAL BASIS

Southeastern Public Service Authority
Suffolk Regional Landfill, Suffolk, Virginia
Permit No. TRO - 61341

Title V of the 1990 Clean Air Act Amendments required each state to develop a permit program to ensure that certain facilities have federal Air Pollution Operating Permits, called Title V Operating Permits. As required by 40 CFR Part 70 and 9 VAC 5 Chapter 80, Southeastern Public Service Authority has applied for a Title V Operating Permit for its Suffolk facility. The Department has reviewed the application and has prepared a draft Title V Operating Permit.

Engineer/Permit Contact: _____

Date:

Air Permit Manager: _____

Date:

Regional Permit Manager: _____

Date:

FACILITY INFORMATION

Permittee

Southeastern Public Service Authority
723 Woodlake Drive
Chesapeake, Virginia 23320

Facility

Suffolk Regional Landfill
1 Bob Foeller Drive
Suffolk, Virginia 23434

Co-Operator

Suffolk Energy Partners, L.P.
40 Tower Lane / 1st Floor
Avon, CT 06001

ID No. 51-800-00121

SOURCE DESCRIPTION

SIC Code: 4953 – The SPSA Regional Landfill at Suffolk is a sanitary landfill located at 1 Bob Foeller Drive east of the city of Suffolk, Virginia and is owned by the Southeastern Public Service Authority. The landfill began accepting waste in 1985 under Solid Waste Permit No. 417 dated October 14, 1984. This permit allowed the construction of the first four cells (Cells I, II, III and IV). As a sanitary landfill regulated by the Commonwealth of Virginia, the landfill is permitted to accept only solid wastes that are defined and regulated under the Commonwealth of Virginia Solid Waste Management Regulations. The waste materials are generated from the area Cities of Virginia Beach, Norfolk, Portsmouth, Chesapeake, Franklin and Suffolk, including the counties of Isle of Wight and Southampton and consists of general domestic household waste, commercial waste and construction debris with some ash cover from the SPSA RDF plant. Only non-liquid, non-hazardous and non-infectious wastes are accepted at the landfill.

A vertical expansion within the existing footprint (Cells I-IV) resulted in additional disposal capacity. In March 1994, the Virginia Department of Environmental Quality (DEQ) issued a solid waste permit amendment to allow a horizontal expansion of the landfill for the construction of Cell V. With the addition of Cell V, this would provide disposal capacity beyond year 2002 and possibly up to year 2009. The combined capacities of Cells I-IV equals 6.58 million megagrams. This capacity may be reached in late 2003. Cells I-IV have stopped receiving waste and will be closed during 2002. Cell V, which has been under construction for several years, will expand the design capacity to approximately 8.49 million megagrams of waste in place by the planned closure

year of 2009.

Activities currently occurring at the landfill include landfilling operations, groundwater and leachate pumping, landfill gas collection and control, and maintenance of landfill equipment. Sources of potential emissions consist of (01) the municipal solid waste disposal areas, (02) a yard-waste composting operation, (03) a ferrous metals recovery operation, (04) a tire shredding operation, (05) leachate aeration, (06) 10,000 gallon diesel tank, (07) 10,000 gallon diesel tank, (08) 3000 gallon hydraulic oil tank, (09) 2500 gallon motor oil tank, (10) 2000 gallon waste oil tank, (11) diesel fired water pump, (12) maintenance activities – trucks and landfill equipment, (13) fugitive dust – landfill and haul roads, (FL-1) candle flare, (GEN1, GEN2, GEN3, GEN4) generator sets burning landfill gas and an off-site gas combustion device (OS-1). Insignificant activities or emission units consist of the units 02 – 11 inclusive. The facility's emission units are listed in the table on page 4.

The facility is a Title V major source by virtue of the applicability of 40 CFR 60, Subpart WWW, which states in part, "all landfills whose Initial Design Capacity exceeds 2.5 million megagrams of waste capacity shall be permitted under the Title V program". This source is located in an attainment area for all pollutants and is considered a major source. The landfill property, itself, has never been permitted under any other air program, although a construction permit was issued to Power Generation in 1995 to construct and operate landfill gas combustion equipment.

COMPLIANCE STATUS

The facility is inspected yearly. The facility is subject to 40 CFR 60, Subpart WWW, having completed a modification to the landfill after May 30, 1991 and having a design capacity that exceeds 2.5 million megagrams of solid waste. The Initial Design Capacity Report (IDCR) was submitted on June 27, 1997. The IDCR initially indicated that the Suffolk Regional landfill would exceed the 50 megagram per year threshold for 'non-methane organic compounds' (NMOC) sometime during the life of the facility. SPSA made the decision to design and install a landfill gas collection and control system (GCCS) on the site. The original NMOC calculations used conservative AP-42 default values to estimate the emissions and the result was in excess of 50 megagrams per year. However, Subpart WWW allows the use of site-specific data in the Tier II calculation method. The SPSA submitted Tier II calculations of NMOC emissions along with the IDCR on June 27, 1997, which indicated the potential emissions of NMOC's were less than the 50 megagram per year threshold. Therefore, SPSA was only required to keep records of waste in-place and to submit an annual NMOC emission rate report update. The most recent test of February 26, 2002 indicates that NMOC emissions of 50 megagrams per year or greater have been reached during the year 2002 and the full provisions of Subpart WWW apply, including landfill gas capture and control requirements. SPSA is now required to submit a new Landfill Gas Collection and Control System Design Plan, in accordance with the NSPS requirements by June 6, 2003.

EMISSION UNIT AND CONTROL DEVICE IDENTIFICATION

The emissions units associated with this facility consist of the following units. Units located at the Power Generation site include FL-1, GEN-1, GEN-2, GEN-3 and GEN-4.

- FL-1 Candle Flare
- GEN-1 generator set #1
- GEN-2 generator set #2
- GEN-3 generator set #3
- GEN-4 generator set #4
- OS-1 offsite combustion device
- LFO-1 Landfill operations
- GCCS Gas Collection and Control System
- MAINT Vehicle and other facility equipment maintenance
- 13 Fugitive dust from landfill operations and haul roads

EMISSIONS INVENTORY

Actual emission estimates for 2000 were provided by the Southeastern Public Service Authority with the application for the Title V permit. Emission levels are expected to increase over time.

2000 Actual Emissions

	2000 Criteria Pollutant Emissions in Tons/Year				
Emission Unit	VOC	CO	SO ₂	PM ₁₀	NO _x
Landfill Operations	4.83 Tons (as NMOC)	N/A	N/A	N/A	N/A
Combustion Equipment	29.9	200.2	2.1	8.0	69.3
Total	34.7	200.2	2.1	8.0	69.3

1997 Facility Hazardous Air Pollutant Emissions

Pollutant	1997 Hazardous Air Pollutant Emissions in Tons/Yr
N/A	HAP's exist only in trace amounts (see application)

EMISSION UNIT APPLICABLE REQUIREMENTS - [emission units LFO-1, FL-1, GEN-1, GEN-2, GEN-3, GEN-4, OS-1 and 13]

Limitations

The Suffolk Regional Landfill has only permits issued by the Waste Division, but a permit for the fuel burning equipment was previously issued to a Company named 'Power Generation'. See the New Source Review permit issued to Power Generation on August 18, 1995 to operate four IC engines on Landfill gas. During 2000 and 2001, a pipeline was constructed to supply LFG to a chemical company for use as fuel. The offsite burning of the landfill gas in process equipment at the chemical company is referred to as unit OS-1. The flare, the offsite device and the engine/generator units are subject to the provisions of the NSPS, Subpart WWW and any Virginia Administrative Codes that have specific emission requirements. The current understanding for facilities that operate landfills subject to the NSPS requires that the landfill owner or operator be responsible for ensuring that all combustion devices meet NSPS requirements. The current provisions for treatment of the landfill gas will allow the facility to forego the initial performance testing of the engines when the GCCS is completed and approved.

- < 9 VAC 5-50-80 "New/Modified source standard for Visible Emissions" – units may not emit greater than 20% opacity except for one six-minute period in any one hour of not more than 30% opacity (reference 40 CFR 60, Appendix A. Method 9).
- < 9 VAC 5-50-20 "Facility and Control Equipment Maintenance or Malfunction" – at all times, the facility, including associated air pollution control equipment, must be maintained and operated in a manner consistent with air pollution control practices for minimizing emissions.

Periodic Monitoring

The monitoring and recordkeeping requirements listed in this permit have been drafted to meet Part 70 requirements and those contained in the 40 CFR 60.756. The estimated emissions from this landfill operation were calculated from the 'Landfill Gas Emission Model', accumulated amount of waste in-place, the flow and analysis of the LFG and the default emission factors from the AP-42, Section 2.4. Assumptions and default values that were prominent in these calculations are as follows:

- < Facility emissions are based on the assumption that any efficient LFG collection system has a maximum capture of 75% on the landfill.
- < The VOC emissions assumed a default value equal to 39% of the generated NMOC content of the landfill gas flow.

Calculation Demonstration

No periodic monitoring for the emission limits for criteria pollutants is required in the permit. The following demonstration is provided to show that there is not a great likelihood that the emission limits will be exceeded:

PM-10 emissions for the engines are based on the aggregate throughput of treated landfill routed to the engines for combustion and the destruction of NMOC content.

Landfill gas routed to the engines is limited by a permit dated August 18, 1995, where the maximum expected throughput of landfill gas was estimated at 656 million cubic feet. The calculation estimate is based on AP-42, Section 2.4 emission factors (11/98). Current routing of the gas is to send one-half to the off-site combustion unit, OS-1 and the other half to the engines at the Suffolk Energy Partners, L.P. facility, i.e., the four engines.

$PM-10 = 656 \times 10^6 (48\# / 10^6 \text{ dscf-CH}_4) (50\% \text{ CH}_4) = 7.87 \text{ tons-PM-10} \times 50\% \text{ to engines} =$
 $PM-10 \text{ from the engines} = 7.87 \times (0.5) = \underline{\mathbf{3.935 \text{ Tons-PM-10}}}$ emissions from the engines.

The TITLE V permitted rate is **5.3 tons-PM-10/year**

$NO_x = 656 \times 10^6 (250\# / 10^6 \text{ dscf-CH}_4) (50\% \text{ CH}_4) = 82 \text{ tons-PM-10} \times 50\% \text{ to engines} =$
 $NO_x \text{ from the engines} = 82.0 \times (0.5) = \underline{\mathbf{41 \text{ Tons-NO}_x}}$ emissions from the engines.

The TITLE V permitted rate is **63.0 tons-NO_x/year**

$CO = 656 \times 10^6 (470\# / 10^6 \text{ dscf-CH}_4) (50\% \text{ CH}_4) = 154.16 \text{ tons-PM-10} \times 50\% \text{ to engines} =$
 $CO \text{ from the engines} = 154.16 \times (0.5) = \underline{\mathbf{77.1 \text{ Tons-CO}}}$ emissions from the engines.

The TITLE V permitted rate is **82.3 tons-CO/year**

Flare emissions contribute to the overall facility emissions for Title V permitting and are estimated to be as follows, utilizing the AP-42, Section 2.4 emissions factors for an open flare:

$PM-10 = 1000 \times 10^6 (17\# / 10^6 \text{ dscf-CH}_4) (50\% \text{ CH}_4) = \underline{\mathbf{4.25 \text{ Tons-PM-10 per year}}}$

Total facility PM-10 emissions = **3.935 + 4.25 = 8.185 Tons -PM-10 per Year**

The TITLE V permitted rate is **21.2 tons-PM-10/year**

$NO_x = 1000 \times 10^6 (40\# / 10^6 \text{ dscf-CH}_4) (50\% \text{ CH}_4) = \underline{\mathbf{10 \text{ Tons-NO}_x \text{ per year}}}$

Total facility NO_x emissions = **41.0 + 10.0 = 51.0 Tons -NO_x per Year**

The TITLE V permitted rate is **103.8 tons-NO_x/year**

$CO = 1000 \times 10^6 (750\# / 10^6 \text{ dscf-CH}_4) (50\% \text{ CH}_4) = \underline{\mathbf{187.5 \text{ Tons-CO per year}}}$

Total facility CO emissions = **82.3 + 187.5 = 269.8 Tons -CO per Year**

The TITLE V permitted rate is **283.7 tons-CO/year**

SO₂ estimates, based on procedures in Section 2.4.4 or the AP-42, gives the following:

Default concentrations of the sulfur compounds identified in landfill gas are equal to:

Attachment A-6 January 31, 2005

Carbon Disulfide, mw = 76.13, 0.58 ppmv; Carbonyl Sulfide, mw = 60.07, 0.49; Dimethyl Sulfide, mw = 62.13, 7.82 ppmv; Hydrogen Sulfide, mw = 34.08, 35.5 ppmv; Methyl Mercaptan, mw = 48.11, 2.49 ppmv. Total ppmv = 0.58 + 0.49 + 7.82 + 35.5 + 2.49 = 46.38 ppmv = C_P .

$[Q_P = 1.82 \times Q_{CH_4} \times C_P / 10^6]$ for this calculation, insert total default ppmv sulfur.

$[Q_P = 1.82 \times 4.34 \times 10^7 \text{ cu.m./yr} \times 46.38 \text{ ppmv} / 10^6] = 3663 \text{ cm/year of SO}_2$

The uncontrolled mass of this pollutant from equation (4) shows that with only 3663 cubic meters of SO₂ per year, that the emission rate is less than one ton.

The TITLE V permitted rate is **7.9 tons-SO₂/year**

Based on the demonstration, it appears there is not a great likelihood that the emission limits will be exceeded, and no additional periodic monitoring other than opacity has been required for this facility.

- < VOC emissions for the flare were determined by multiplying the NMOC: Methane ratio values for the facility with the amount of methane that went to the flare for the year 2000. The result was then multiplied by the 0.02% of the landfill gas which is not destroyed in the flare and then the 39% VOC : NMOC relationship as referenced in AP-42, Section 2.4. The calculation would look something like:
- < $\text{VOC(flare)} = [12.38 \text{ tpy} / 3.493 \times 10^7 \text{ m}^3(35.3145 \text{ ft}^3/\text{m}^3)] \times 629.0 \times 10^6 \text{ ft}^3 \times 0.39 \times 0.02$
 $\text{VOC(flare)} = \underline{0.05 \text{ tons per year.}}$
- < The NO_x values for the flare were estimated using the amount of production from the flare for the year 2000. That number was divided in half to represent the methane partition of the landfill gas which averages around 50%. The AP-42 emission factor for the combustion of landfill gas in a candle flare in Section 2.4 is listed as 40 lbs-NO_x/dscf of CH₄.
- < The PM₁₀ values for the flare were estimated in the same manner as stated in the previous explanation for NO_x, except that the PM₁₀ emission factor is 17 lbs-PM₁₀/dscf of CH₄.
- < Total reduced sulfur represents the sum of Hydrogen Sulfide, Carbonyl Sulfide and Carbon Disulfide values that were calculated using the EPA Landgem Model.

Recordkeeping

The permit includes requirements for maintaining records of all monitoring and testing required by the regulations. These records include the annual throughput of landfill gas, control efficiency tests of the control equipment, the annual placement of MSW in the landfill and all monitoring information for the GCCS, flare and engines. These specific requirements are listed in 40 CFR 60.758

Testing

An annual test will be performed to determine the actual destruction efficiency of the control equipment for NMOC. Reference 40 CFR 60.752 which specifies the initial performance test and in accordance with Section 60.754(d) which describes the test method.

Reporting

All reports required by Subpart WWW (Section 60.755) shall be prepared and submitted to the Tidewater Regional Office in accordance with procedures outlined in Subpart WWW (Section 60.757).

Streamlined Requirements

The permit does not contain any streamlining of permit requirements.

GENERAL CONDITIONS

The permit contains general conditions required by 40 CFR Part 70 and 9 VAC 5-80-110, that apply to all Federal operating permit sources. These include requirements for submitting semi-annual monitoring reports and an annual compliance certification report. The permit also requires notification of deviations from permit requirements or any excess emissions, including those caused by upsets, within one business day.

B. Permit Expiration

This condition refers to the Board taking action on a permit application. The Board is the State Air Pollution Control Board. The authority to take action on permit application(s) has been delegated to the Regions as allowed by §2.1-20.01:2 and §10.1-1185 of the *Code of Virginia*, and the "Department of Environmental Quality Agency Policy Statement NO. 3-2001".

This general condition cites the entire Article(s) that follow:

B.2. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources

B.3. Article 1 (9 VAC 5-80-50 et seq.), Part II of 9 VAC 5 Chapter 80. Federal Permits for Stationary Sources

This general condition cites the sections that follow:

B. 9 VAC 5-80-80. "Application"

B.2. 9 VAC 5-80-150. "Action on Permit Applications"

B.3. 9 VAC 5-80-80. "Application"

B.4. 9 VAC 5-80-80. "Application"

B.4. 9 VAC 5-80-140. "Permit Shield"

B.5. 9 VAC 5-80-80. "Application"

F. Failure/Malfunction Reporting

Section 9 VAC 5-20-180 requires malfunction and excess emissions reporting within 4 hours. Section 9 VAC 5-80-250 also requires malfunction reporting; however, reporting is required within 2 days. Section 9 VAC 5-20-180 is from the general regulations. All affected facilities are subject to this section including Title 5 facilities. Section 9 VAC 5-80-250 is from the Title 5 regulations. Title 5 facilities are subject to both Sections. A facility may make a single report that meets the requirements of 9 VAC 5-20-180 and 9 VAC 5-80-250. The report must be made within 4 day time business hours of the malfunction.

In order for emission units to be relieved from the requirement to make a written report in 14 days, the emission units must have continuous monitors and the continuous monitors must meet the requirements of 9 VAC 5-50-410 or 9 VAC 5-40-41.

This general condition cites the sections that follow:

- F. 9 VAC 5-40-50. Notification, Records and Reporting
- F. 9 VAC 5-50-50. Notification, Records and Reporting
- F.1. 9 VAC 5-40-50. Notification, Records and Reporting
- F.1. 9 VAC 5-50-50. Notification, Records and Reporting
- F.2. 9 VAC 5-40-50. Notification, Records and Reporting
- F.2. 9 VAC 5-50-50. Notification, Records and Reporting
- F.3. 9 VAC 5-40-50. Notification, Records and Reporting
- F.3. 9 VAC 5-40-41. Emissions Monitoring Procedures for Existing Sources
- F.3.a. 9 VAC 5-40-41. Emissions Monitoring Procedures for Existing Sources

This general condition contains a citation from the Code of Federal Regulations as follows:

- F.2.a. 40 CFR 60.13 (h). Monitoring Requirements.

U. Failure/Malfunction Reporting

The regulations contain two reporting requirements for malfunctions that coincide. The reporting requirements are listed in section 9 VAC 5-80-250 and 9 VAC 5-20-180. The malfunction requirements are listed in General Condition U and General Condition F. For further explanation see the comments on general condition F.

This general condition cites the sections that follow:

- U.2.d. 9 VAC 5-80-110. Permit Content
- U.2.d. 9 VAC 5-20-180. Facility and Control Equipment Maintenance or Malfunction

STATE ONLY APPLICABLE REQUIREMENTS

The following Virginia Administrative Codes have specific requirements only enforceable by the State and have been identified as applicable by the applicant:

9 VAC 5 Chapter 50, Part II, Article 2: Standards of Performance for Odorous Emissions (Rule 5-2)

9 VAC 5 Chapter 50, Part II, Article 3: Standards of Performance for Toxic Pollutants (Rule 5-3)

FUTURE APPLICABLE REQUIREMENTS

The facility has no other requirements that will apply in the future. All applicable requirements for NSPS WWW landfills are contained in the permit at this time. However, it must be recognized that amendments have been proposed to this Subpart and that the future promulgation of these amendments to the regulation may impact this operating permit.

INAPPLICABLE REQUIREMENTS

The facility has not identified any inapplicable requirements in their permit application.

COMPLIANCE PLAN

The source does not have the requirement of a compliance plan.

INSIGNIFICANT EMISSION UNITS

The insignificant emission units are presumed to be in compliance with all requirements of the Clean Air Act as may apply. Based on this presumption, no monitoring, recordkeeping or reporting shall be required for these emission units in accordance with 9 VAC 5-80-110.

Insignificant emission units include the following:

Emission Unit No.	Emission Unit Description	Citation ¹ (9 VAC_)	Pollutant Emitted (5-80-720 B.)	Rated Capacity (5-80-720 C.)
02	Compost Operations	5-80-720 B	VOC	N/A
03	Ferrous Metals Recovery	5-80-720 B	PM	N/A
04	Tire Shredding	5-80-720 B	PM	N/A

Emission Unit No.	Emission Unit Description	Citation ¹ (9 VAC_)	Pollutant Emitted (5-80-720 B.)	Rated Capacity (5-80-720 C.)
05	Leachate Lagoon	5-80-720 B	VOC	N/A
06	Diesel Storage Tank	5-80-720 C	VOC	10,000 gallons
07	Diesel Storage Tank	5-80-720 C	VOC	10,000 gallons
08	Hydraulic Oil Tank	5-80-720 C	VOC	3000 gallons
09	Motor Oil Tank	5-80-720 C	VOC	2500 gallons
10	Waste Oil Tank	5-80-720 C	VOC	2000 gallons
11	Diesel Water Pump	5-80-720 C	NOx, CO2, SO2, PM10, VOC	100 HP

¹The citation criteria for insignificant activities are as follows:

9 VAC 5-80-720 A - Listed Insignificant Activity, Not Included in Permit Application

9 VAC 5-80-720 B - Insignificant due to emission levels

9 VAC 5-80-720 C - Insignificant due to size or production rate

CONFIDENTIAL INFORMATION

The permittee did not submit a request for confidentiality. All portions of the Title V application are suitable for public review.

PUBLIC PARTICIPATION

The proposed permit will be placed on public notice in the Virginian Pilot from September 13, 2002 to October 12, 2002.